

# Stacking Virtual Machines – VMware and VirtualPC

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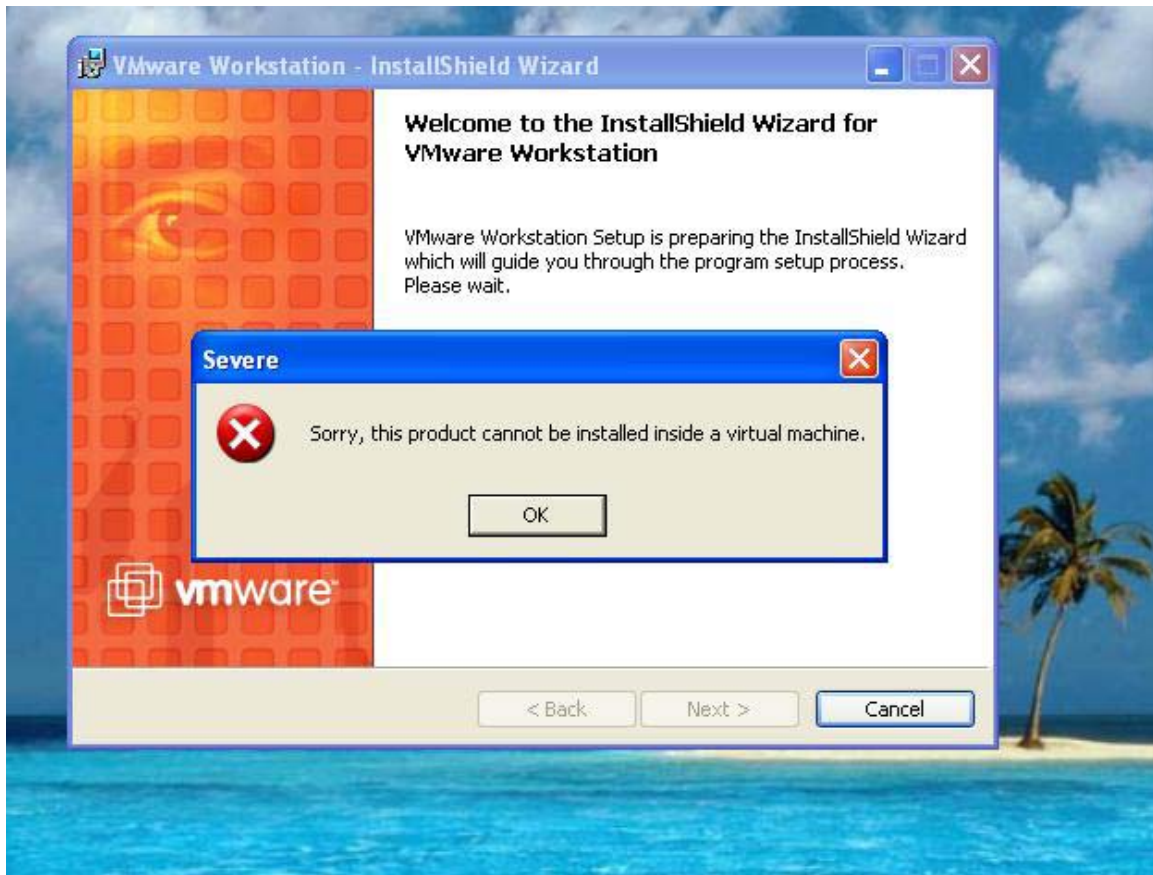
## 1 Introduction

In this short paper, we report our experience trying to stack virtual machines on top of one another. In particular we looked at VMware and VirtualPC both running on Windows XP as the host operating system. We have tried all possible stacking combinations of these two VMs (1) VMware on top of VMware, (2) VirtualPC on top of VMware, (3) VMware on top of VirtualPC, and (4) VirtualPC on top of VirtualPC. In all four cases, stacking failed. However, we found some interesting results in that the mode in which they failed is very different from one case to another.

## 2 Within VMware

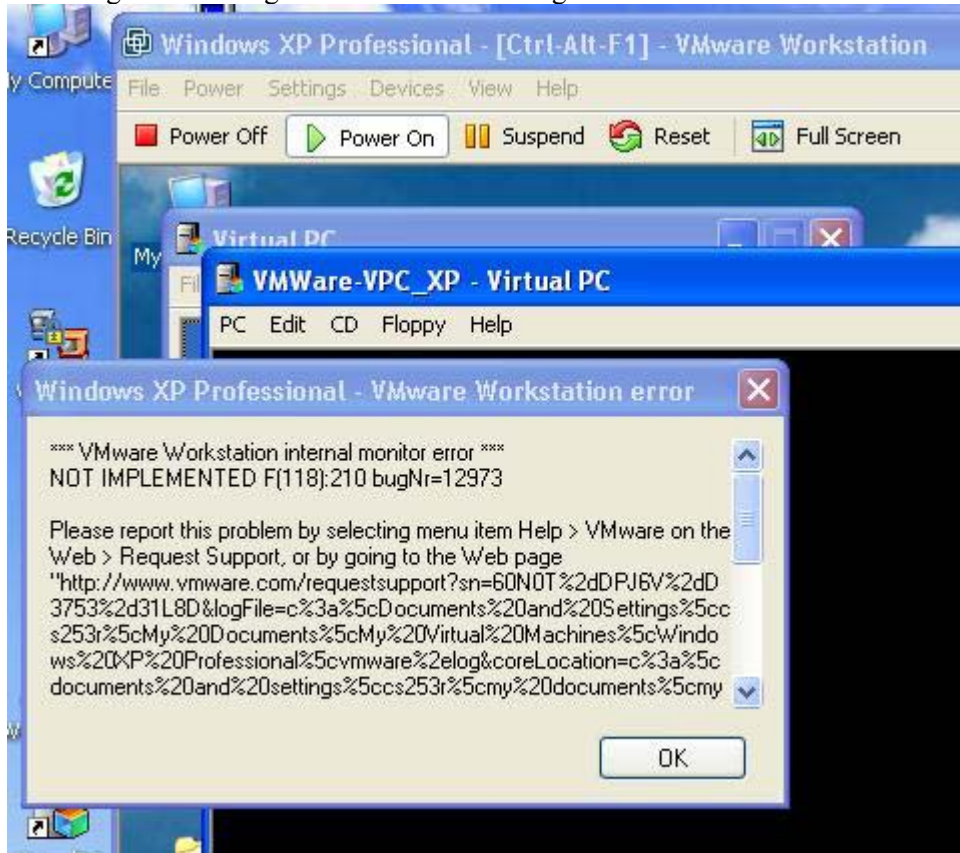
### 2.1 We tried to install VMware

VMware refuses to install on itself. It recognizes during the installation process that it is running on VMware and pops up the following error message (inside the guest OS): VMware does not crash. Here is a screen-capture:



## 2.2 We tried to install VirtualPC

VirtualPC installs just fine on VMware. When we reboot and try to run VirtualPC, we get the following error message from VMware running on the host OS:



The text of the message reads:

```
*** VMware Workstation internal monitor error ***  
NOT IMPLEMENTED F(118):210 bugNr=12973
```

```
Please report this problem by selecting menu item Help > VMware on the  
Web > Request Support, or by going to the Web page  
"http://www.vmware.com/requestsupport?sn=60NOT%2dDPJ6V%2dD3753%2d31L8D&lo  
gFile=c%3a%5cDocuments%20and%20Settings%5ccs253r%5cMy%20Documents%5cMy%20  
Virtual%20Machines%5cWindows%20XP%20Professional%5cVMware%2elog&coreLocat  
ion=c%3a%5cdocuments%20and%20settings%5ccs253r%5cmy%20documents%5cmy%20vi  
rtual%20machines%5cwindows%20xp%20professional%5cvmware%2dcore". Please  
provide us with the log file (c:\Documents and Settings\cs253r\My  
Documents\My Virtual Machines\Windows XP Professional\vmware.log) and the  
core file (c:\documents and settings\cs253r\my documents\my virtual  
machines\windows xp professional\vmware-core).
```

```
If the problem is repeatable, please select 'Run with debugging  
information' in the Options panel of the configuration editor. Then  
reproduce the incident and file it according to the instructions.
```

```
We appreciate your feedback,
```

```
-- the VMware Workstation team.
```

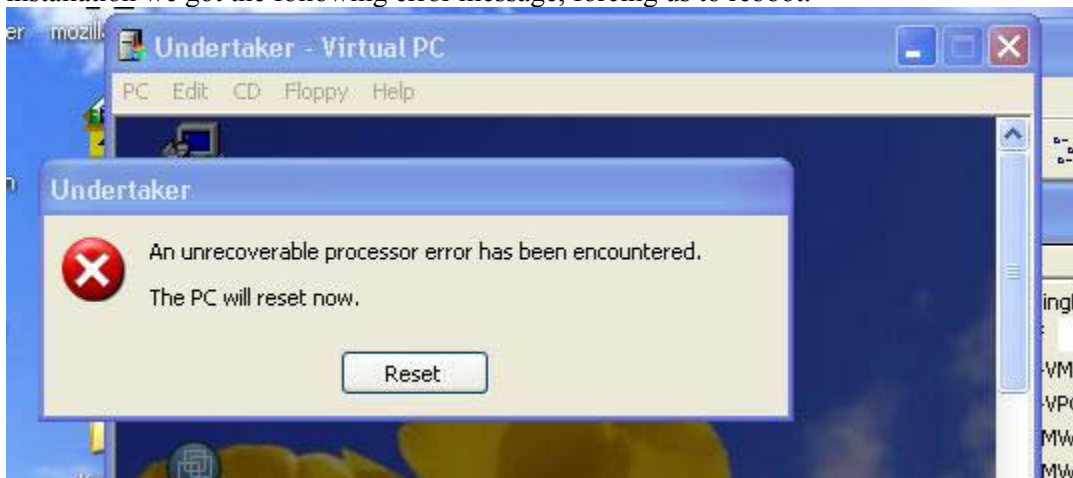
VMware shuts down the VM immediately after you hit “OK”. We suppose that what happens is that VirtualPC can somehow detect that it isn’t running on directly on the host OS, and thus issues instructions to determine if it is running on VirtualPC (not allowed, see later discussion). The instructions that it issues are not normal Windows/x86 instructions, and so VMware doesn’t recognize them and freaks out.

### 3 Within VirtualPC

First we had to get the C drive from the host machine to be recognized on the guest. For this we were forced to install “additional tools” from the PC menu. We went to the settings menu and the shared folders line within that. With the additional tools we finally had the option to add folders.

#### 3.1 We tried to install VirtualPC

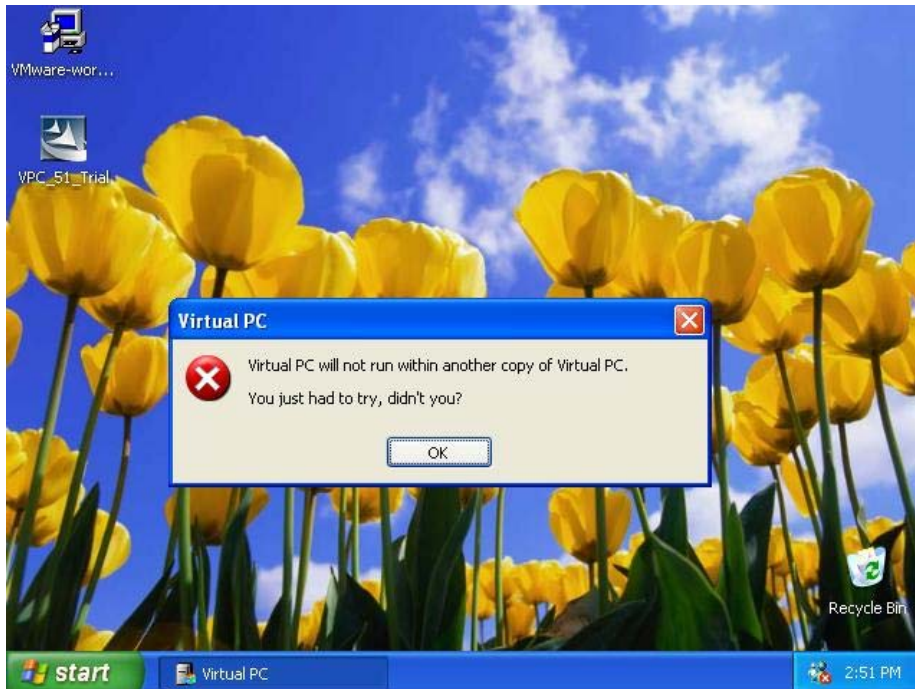
We copied the installation program from the host. Started the install. Half way through the installation we got the following error message, forcing us to reboot:



Once we get back into XP, it keeps telling us that it found new hardware: type System.

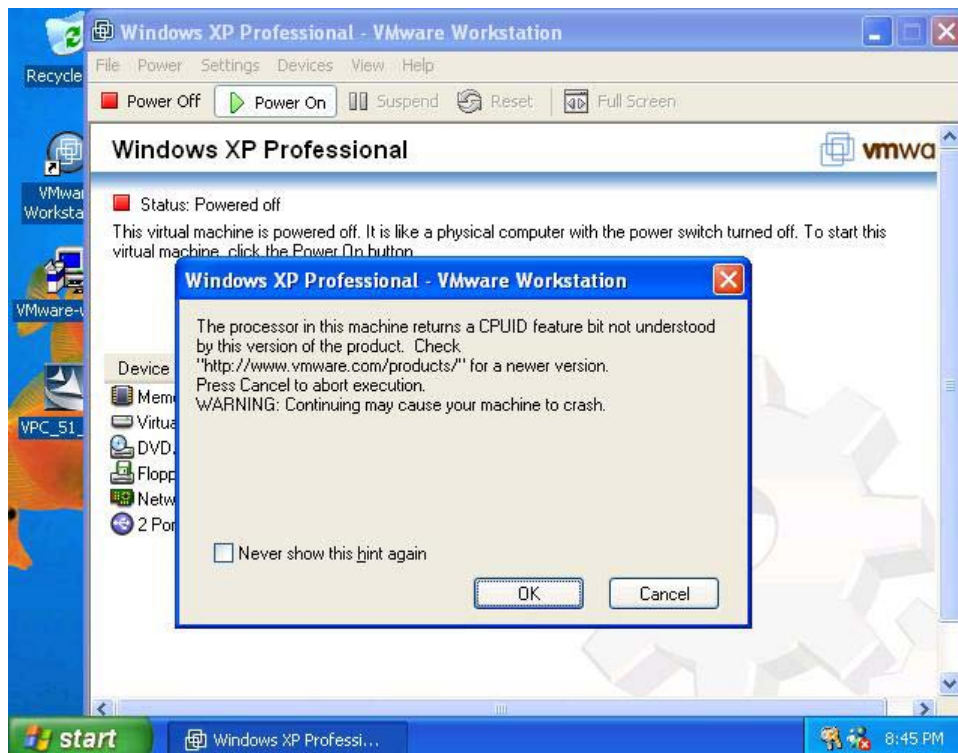


It brings up a hardware installation wizard. We actually went through the entire installation process twice. The first time, we chose to go through the hardware wizard and see what happens. This combined with attempting to remove the VirtualPC software completely destroyed XP. We were no longer able to make it all the way through the XP boot process without seeing the error message displayed above. The second time we went through the install (on a clean XP system) we skipped the hardware wizard. However, attempting to uninstall VirtualPC still causes the error message and forced reboot, although in this case XP can still boot properly. When we try to run the (half installed) VirtualPC on VirtualPC, it mocks us as follows:



### 3.2 We tried to install VMware

We copied the installer from the host machine. Installing VMware worked just fine. We restarted the machine. No problems. When we went to start VMware, we went through several registration screens, and then VMware gave us a message warning that the system may crash if we continued. Here is the message:



We chose to continue and sure enough VMware crashed the VirtualPC VM. The VM acted as though the power had been suddenly switched off. VirtualPC gave no indication that anything had gone wrong.

## 4 Why stacking of VMs Fails

### 4.1 VMware – from newsgroup

```
> >No, you can't install VMware inside VMware.
>
> you can't _run_ it. however, installation should not really be a
> problem.
> though the 2.x products used to check and refuse to install in a virtual
> machine. don't know whether that's still the case in the release
> versions
> of 3.0.
>
> >Maybe something like "Bochs inside VirtualPC inside VMware" might work.
> >I'm kinda interested in "virtual machine inside virtual machine"
> >configuration myself, though I suspect there's no practical use of it.
> >Are there anyone crazy enough to try this?
```

*This is where we come in!*

```
> connectix vpc and vmware workstation won't run inside each other (any
> combination), at least, last time i tried. i doubt anything has changed
> enough on vpc's side to make it possible now. never tried bochs.
```

### 4.2 VirtualPC – from discussion board

David A. Mayer's response:

“Because the Intel CPUs don't support multiple ring zero contexts so you can only have one running kernel. IOW, a large part of the CPU architecture is unavailable to guests and is emulated via privilege violation exceptions. However, search the forums Eric Traut, Connectix CTO (former I suppose), documented a registry hack that turns off the check but you are on your own if using it.”